CMT36106/CMT3106
Hard Drive Carrier utilityModule

User's Manual

BDM-610020031
Rev. B

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Revision History

Rev. A	New Manual
Rev. B	Corrected the Jumpers section in Chapter 2.

Published by:

RTD Embedded Technologies, Inc.
103 Innovation Blvd.
State College, PA 16803-0906

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Chapter 1 INTRODUCTION

This manual gives information on the CMT36106 Hard Disk Carrier utilityModule. This module attaches to the EIDE and PC/104 connector of a cpuModule, allowing a high speed hard drive interface.

CMT36106 EIDE and Hard Drive Carrier utilityModule

The CMT36106 utilityModule was designed to provide an EIDE hard drive or Flash drive in the PC/104 stack to support the Real Time Devices family of cpuModules that have integrated EIDE controllers.

Notes:	The CMT36106 is not an EIDE controller. It is only a drive carrier. It must be used with a cpuModule that has an on-board EIDE controller.

CMT3106 Hard Drive Carrier utilityModule with Hard Drive

The CMT3106 is a CMT36016 shipped with a 2.5” form factor hard drive installed.

Features

The following are major features of the CMT36106 utilityModule.

- Provides a high speed drive interface up to DMA/100 (if supported by the cpuModule)
- A standard 2.5” form factor drive can be mounted directly onto the module
- A 0.1” 40-pin connector is provided to connect to a second drive, i.e. a CD-ROM drive.
- A stack through connector is provided to allow two CMT36106 drives in a system.

Connectors

Connectors provided are:

- CN1: PC/104 Bus (XT)
- CN2: PC/104 Bus (AT)
- CN3: EIDE hard drive connector
- CN4: EIDE stack through connector
- CN5: EIDE cable connector

Recommended Cables

- 40-conductor or 80-conductor EIDE cable which can be used to connect an external drive (hard drive or CD-ROM drive) to the CMT36106.

General Specifications

- Dimensions: 3.8 x 3.9 x 0.6" (97 x 100 x 16 mm)
- Weight (mass): 3.0 ounces (85 grams)
- 4-layer PCB
- Operating conditions: (not including drive)
- temperature: -40 - +85 degrees C
- relative humidity: 0 - 95%, non-condensing
- Storage temperature: -55 to +125 degrees C

Chapter 2 CONFIGURING THE UTILITYMODULE

The following sections contain information on configuring the utilityModule.

Please read this entire section before attempting to use the utilityModule.

Cable modes

There are two types of cables that are used for EIDE drives: a 40 conductor cable, and an 80 conductor cable. The 80 conductor cable adds a ground wire between each signal, and uses the standard 40 pin connectors. A 40 conductor cable can be used for speeds up to UDMA Mode 2 (Ultra ATA/33). An 80 conductor cable is required for higher speeds. The BIOS or operating system detects the type of cable that is attached, and selects an appropriate speed. The CMT36106 can emulate either 40 conductor or 80 conductor cables based on the jumper settings.

Connecting External Drives

External EIDE drives can be connected to CN5 of the CMT36106. This can be either an additional hard drive, or a CD-ROM drive. In this configuration, one of the drive must be configures as a master, and one as a slave.

When using an external drive, a 40 conductor cable is generally used, and the board configured in 40 conductor mode. If higher transfer rates are desired, 80 conductor mode can be used. The ATA specification limits an 80 conductor cable to 18 inches in length. The CMT36106 has about 12 inches of trace, so a cable attached to CN5 in 80 conductor mode may only be 6 inches in length. Also, not all signals go to all connectors on an 80 conductor cable. The section of the cable that attaches to the drives should be used, and the remaining cable should be discarded.

Jumpers

Jumper JP1 configures the following functions:

- 40 or 80 conductor mode
- Master/Slave

Table 2.1 shows the jumper settings to select the cable mode for the CMT36106. When two CMT36106 boards are used in the same system, they must both be jumpered for 40-conductor mode.

Table 2.1 Cable Mode Settings

Cable Mode	JP1		Fastest Speed
	5-6	7-8	
40-conductor	Yes	No	Ultra ATA/33
80-conductor	No	Yes	Ultra ATA/100

The first four positions of JP1 directly connect to the master/slave jumpers of the on board EIDE drive. Typical settings are shown in Table 2.2. Note that the settings may be different depending on the drive used. When two CMT36106s are in a system, or a CMT36106 is used with an external drive, one drive must be configured as a master, and the other drive as a slave.

Table 2.2: Drive Mode Settings

Mode	**JP1 Setting (position 1-4)**
Master	None
Slave	3-4
Cable Select (not recommended)	2-4

Notes: The CMT36106 only can only connect to two drives. For example, if two CMT36106s are in a system, a CD-ROM cannot also be connected.

Chapter 3 INSTALLING THE UTILITYMODULE

Since the utilityModule uses a PC/104 and EIDE stack through bus, it must be stacked directly above the cpuModule.

Recommended Procedure

We recommend you follow the procedure below to ensure that stacking of the modules does not damage connectors or electronics.

- Turn off power to the PC/104 system or stack.
- Select and install standoffs to properly position the utilityModule on the PC/104 stack.
- Touch a grounded metal part of the stack to discharge any buildup of static electricity.
- Remove the utilityModule from its anti-static bag.
- Verify the jumper settings of the utilityModule.
- Check that keying pins in the PC/104 bus connector are properly positioned.
- Hold the utilityModule by its edges and orient it so the bus connector pins line up with the matching connector on the stack.
- Gently and evenly press the utilityModule onto the PC/104 stack.

CAUTION: Do not force the module onto the stack! Wiggling the module or applying too much force may damage it. If the module does not readily press into place, remove it, check for bent pins or out-of-place keying pins, and try again.

Chapter 4 CONNECTING THE UTILITYMODULE

The following sections describe connectors of the utilityModule.

Finding Pin 1 of Connectors

A white area silk-screened on the PC board indicates the pin 1 end of connectors. A square solder pad visible on the bottom of the PC board also indicates it.

Please make certain you have correctly identified pin 1 of a connector before you connect to it and attempt to use the utilityModule.

Connector Locations

The figure below shows connector locations.

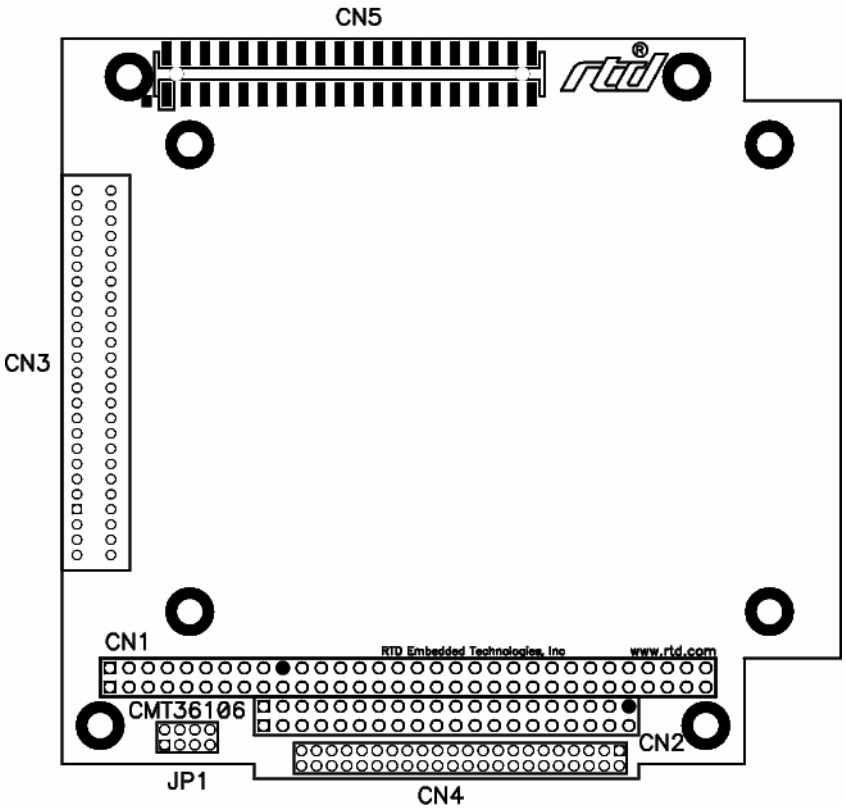

Figure 4.1 CMT36106 Connector Locations

Connectors		
Connector	**Function**	**Size**
CN1	PC/104 XT Bus	64 pin
CN2	PC/104 AT Bus	40 pin

CN3	EIDE Drive Connector	50 pin
CN4	EIDE Stack through Connector	44 pin
CN5	EIDE Cable Connector	40 pin
JP1	Options Jumper	8 pin

PC/104 Bus Connectors, CN1 and CN2

Connectors CN1 and CN2 provide PC/104 bus connections. CN1 carries XT bus signals, and CN2 carries additional signals for the AT bus. The signals on CN1 and CN2 conform to the IEEE P966 standard for the PC/104 bus. The CMT36106 only connects to the power pins of the PC/104 bus.

The following tables list the connector pin outs:

PC/104 XT Bus Connector, CN1		
Pin	**Row A**	**Row B**
1	IOCHCHK*	0V
2	SD7	RESETDRV
3	SD6	+5V
4	SD5	IRQ9
5	SD4	-5V
6	SD3	DRQ2
7	SD2	-12V
8	SD1	ENDXFR*
9	SD0	+12V
10	IOCHRDY	(KEYING PIN)
11	AEN	SMEMW*
12	SA19	SMEMR*
13	SA18	IOW*
14	SA17	IOR*
15	SA16	DACK3
16	SA15	DRQ3
17	SA14	DACK1*
18	SA13	DRQ1
19	SA12	REFRESH
20	SA11	SYSCLK
21	SA10	IRQ7
22	SA9	IRQ6
23	SA8	IRQ5
24	SA7	IRQ4
25	SA6	IRQ3
26	SA5	DACK2*
27	SA4	TC
28	SA3	BALE
29	SA2	+5V
30	SA1	OSC
31	SA0	0V
32	0V	0V

PC/104 AT Bus Connector, CN2		
Pin	**Row C**	**Row D**
0	0V	0V
1	SBHE*	MEMCS16*
2	LA23	IOCS16*
3	LA22	IRQ10
4	LA21	IRQ11
5	LA20	IRQ12
6	LA19	IRQ15
7	LA18	IRQ14
8	LA17	DACK0*
9	MEMR*	DRQ0
10	MEMW*	DACK5*
11	SD8	DRQ5
12	SD9	DACK6*
13	SD10	DRQ6
14	SD11	DACK7*
15	SD12	DRQ7
16	SD13	+5V
17	SD14	MASTER*
18	SD15	0V
19	(KEYING PIN)	0V

Note: Two locations on the bus have mechanical keying pins to help prevent misconnection of the PC/104 bus. These keying pins are a part of the PC/104 standard, and we strongly recommend you leave them in place.

If you have other modules without keying pins, we suggest you modify them to include keying.

EIDE Drive Connector, CN3

CN3 is a 50-pin 2mm DIL connector used to attach to the board mounted hard drive. The pin out of this connector is shown below.

EIDE Hard Drive Connector, CN3			
Pin	**Signal**	**Function**	**in/out**
A		Option Selection Pin	
B		Option Selection Pin	
C		Option Selection Pin	
D		Option Selection Pin	
Key	n.c.		
Key	n.c.		
1	RESET*	Reset HD	out
2	GND	Ground signal	--
3	HD7	HD data 7	in/out
4	HD8	HD data 8	in/out

5	HD6	HD data 6	in/out
6	HD9	HD data 9	in/out
7	HD5	HD data 5	in/out
8	HD10	HD data 10	in/out
9	HD4	HD data 4	in/out
10	HD11	HD data 11	in/out
11	HD3	HD data 3	in/out
12	HD12	HD data 12	in/out
13	HD2	HD data 2	in/out
14	HD13	HD data 13	in/out
15	HD1	HD data 1	in/out
16	HD14	HD data 14	in/out
17	HD0	HD data 0	in/out
18	HD15	HD data 15	in/out
19	GND	Ground signal	--
20	n.c.		--
21	AEN	Address Enable	out
22	GND	Ground signal	--
23	IOW*	I/O Write	out
24	GND	Ground signal	--
25	IOR*	I/O Read	out
26	GND	Ground signal	--
27	IOCHRDY	I/O Channel Ready	in
28	BALE	Bus Address Latch Enable	out
29	n.c.		
30	GND	Ground signal	--
31	IRQ	Interrupt Request	in
32	IOCS16*	16 bit transfer	in
33	A1	Address 1	out
34	GND	Ground signal	--
35	A0	Address 0	out
36	A2	Address 2	out
37	HCS0*	HD Select 0	out
38	HCS1*	HD Select 1	out
39	LED	HDD activity LED (-)	in
40	GND	Ground signal	--
41	+5V	Logic Power	Pwr
42	+5V	Motor Power	Pwr
43	GND	Power Ground	--
44	n.c.		

EIDE Stack through Connector, CN4

CN4 is a 44-pin 2mm DIL connector is the EIDE stack through connector. The pin out of this connector is the same as pins 1-44 of CN3.

EIDE Cable Connector, CN5

CN5 is a 40-pin 0.1" DIL connector is the EIDE cable connector. The pin out of this connector is the same as pins 1-40 of CN3.

Chapter 5 RETURN POLICY AND WARRENTY

Return Policy

If you wish to return a product to the factory for service, please follow this procedure:

Read the Limited Warranty to familiarize yourself with our warranty policy.

Contact the factory for a Return Merchandise Authorization (RMA) number.

Please have the following available:

- Complete board name
- Board serial number
- A detailed description of the board's behavior

List the name of a contact person, familiar with technical details of the problem or situation, **along with their phone and fax numbers, address, and e-mail address** (if available).

List your shipping address!!

Indicate the shipping method you would like used to return the product to you.
We will not ship by next-day service without your pre-approval.

Carefully package the product, using proper anti-static packaging.

Write the RMA number in large (1") letters on the outside of the package.

Return the package to:

RTD Embedded Technologies, Inc.
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State College PA 16803-0906
USA

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